

AVRIL 2001

**GRÉGOIRE**  **BESSON**

**OPERATOR'S MANUAL**

**MAINTENANCE INSTRUCTIONS**

**FULLY MOUNTED ONE WAY PLOUGHS**

**RANGE S4**

**RANGES : SC4 – SB4 – SY4**



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<b>SOMMAIRE</b>
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	<b>Pages</b>
<b>1 – INTRODUCTION</b>	<b>1</b>
<b>2 – GENERAL SAFETY INSTRUCTIONS</b>	<b>2 - 4</b>
<b>3 – HITCHING</b>	<b>5</b>
<b>4 – PREPARING THE MACHINE</b>	<b>6 to 10</b>
<b>5 – PLOUGHING DEPTH</b>	<b>10</b>
<b>6 – INCLINATION</b>	<b>10</b>
<b>7 – LEVELLING</b>	<b>10</b>
<b>8 – ALIGNMENT CORRECTION</b>	<b>11</b>
<b>9 – DEPORT CORRECTION</b>	<b>11</b>
<b>10 – BOTTOMS PITCH</b>	<b>11</b>
<b>11 – TRANSPORT</b>	<b>12</b>
<b>12 – LIGHT BOLT SAFETY DEVICE TYPE "C"</b>	<b>12</b>
<b>13 – BOLT SAFETY DEVICE TYPE "B"</b>	<b>13</b>
<b>14 – NON-STOP HYDRAULIC SAFETY DEVICE TYPE "Y"</b>	<b>13 to 15</b>
<b>15 – MAINTENANCE</b>	<b>15 - 16</b>
 <b>ANNEXES :</b>	
<b>Annex A : Hydraulic front furrow arm</b>	<b>17 - 18</b>
<b>Annex B : Gauge wheel RTS / S4</b>	<b>19</b>

## **1 – INTRODUCTION**

### **READ CAREFULLY THIS MANUAL.**

For an optimal and safe adjustment, operation and maintenance of the machine, follow all recommendations given hereafter in indicated order.

This manual shall be considered as a part of the machine and should follow it in case of reselling.

### **Plough range S4 is designed for right hand side ploughing only.**

All information, drawings, and specifications given in this manual are the newest at the time of publication.

Manufacturer reserves right to make any modification at any time without any obligation to notice or to modify any delivered or already sold machine.

If the machine has been modified in any way from the original design without written agreement from Grégoire-Besson, the manufacturer does not accept any liability for injury or warranty. Warranty would become void.



This symbol is used in the following manual to catch your attention on warnings concerning your safety.

So please when you see it in this manual or on the machine, strictly follow given informations.

**SAFE OPERATION IS THE BEST WARRANTY AGAINST ACCIDENT.**

## **2 – GENERAL SAFETY INSTRUCTIONS**

### **[2-1] SAFETY WHILE ATTACHING AND DETACHING**



- Do not let **anyone to stand between the machine and the tractor** when you back up to hitch.
- Before leaving the tractor to hitch or unhitch, set tractor parking brakes.
- Never attempt to attach the machine if pins, tractor hitching balls, tractor drawbar, or machine linkage are worn, cracked or not compatible.
- Completely lower the machine to the ground before unhitching. Make sure it is on a level and firm surface.
- Remove pressure from hydraulic lines before disconnecting them.
- Before leaving the machine for storage, make sure it is in a safe place and that there is no risk to damage whether anything or anyone.

### **[2-2] SAFETY WHILE CONNECTING HYDRAULIC LINES**



- Hydraulic circuit might be highly pressurised.
- **Never use your hands to locate a hydraulic leak.** Hydraulic fluids escaping under pressure have sufficient force to penetrate the skin, causing severe injury. In case of any injury, **see a doctor immediately.**
- For equipments loaded with several hydraulic connectors, **make logical and appropriated connections.**
- Before connecting hydraulic circuit, **make sure that there is no pressure on both sides (tractor and machine).**
- Regularly check hydraulic lines and connections. **Replace any damaged or leaking component** by an original part with the same specifications.
- Before any intervention on hydraulic circuit, **lower machine to the ground and release pressure moving control lever in the tractor's cab.**

## **[2-3] SAFETY WHILE OPERATING MACHINE**

- **Never attempt** any intervention on the machine while it is in motion.
- Do **not** allow anyone to **stand close to pivot points** : bottoms safety device (shearing bolt or non-stop), all pivoting linkage.
- Wear close **fitting clothing** and **appropriate safety devices** for the job you have to do (heavy leather gloves, safety shoes, earplugs, ... ).
- Do not allow anyone to stand close to the machine.
- Do not attempt to do any adjustment if you have not perfectly understood its procedure.
- Always use tools or equipments appropriate to the job you are doing. All Grégoire-Besson equipments are metric standards.
- Learn how to operate your machine and how to use its controls. Do not let anyone operate without instruction.
- Do not extend turnbuckle adjusters too much to avoid any threads damaging or intempestive pulling out.
- Only one person (the operator) should be in the tractor's cab when it is in operation. **No one on the machine while working or travelling on the road.**
- When earring or feeling unusual vibrations, stop the machine. Find the problem and solve it before starting operating again.



If your machine is equipped with a hydraulic folding mechanism, **always use it from tractor's cab, once you are sure that folding area is free from spectators or obstacles.**

## **[2-4] SAFETY FOR MAINTENANCE**



- Maintenance area shall be **clean, dry, with enough light and ventilation.**
- For any intervention on the machine in raised position, **always securely support all components** before starting maintenance.
- **Maintenance operations on elements under pressure or under tension** (resorts, accumulators, ...) require specific procedure and equipments. **Only qualified persons shall perform them in appropriate conditions.**
- After servicing remove all tools, components and parts you used.
- Regularly **check tightness of wheel studs, wearing parts bolts, and all other bolts and nuts.**
- **Always use genuine parts corresponding to manufacturer's technical specification requirements.**

## [2-5] SAFETY FOR ON HIGHWAY TRANSPORT



FOR YOUR OWN SAFETY AND THE ONE OF THE OTHER, RESPECT THE FOLLOWING RULES :

- All Grégoire-Besson equipments shall be used **complying with area's current rules and laws** concerning **safety instructions, accident prevention** and **provision of Highway Code**.
- Before road transport, always **check for wheels studs** and wheels mounting brackets carriage bolts **tightness** ; **check tyres general state and pressure** : do not drive with low pressure, cuts or damaged tyres or rims.
- **Use all devices required by your area's current laws** (lights, reflectors, signs, ... ). They might be removed during field operation to prevent from any damage.  
It is the operator's responsibility to comply with current law and to follow its evolutions.
- Regularly check hitching pins, change them if necessary. Tractor's ball joint may also wear, do not hesitate to replace them with new ones having at least fabrication quality required by manufacturer.
- Drive **at reasonable speed** complying with local laws **to always keep control** of tractor and equipment. Pay special attention on irregular or rough roads. **Do not attempt to drive down a hill faster than it could be possible to drive it up.**
- Tractor used for road transport shall have the same power rating and weight as the one used for field operations.
- **Never attempt any manoeuvre if area is not free from spectators.**
- If your machine is equipped with a **folding mechanism** (manual or hydraulic), **use it making sure folding area is free from spectators** and obstacles.
- Follow all **safe driving practices** when travelling, moreover **on corners, rough or narrow roads.**
- When **leaving tractor** even for a short period, **shut off engine, remove ignition key** and **set parking brakes.**
- Forbid anyone to stand between tractor and machine or on the machine travelling on the road.

## 3 - HITCHING

Plough range S4 has an headstock type SAD4 and a fixed hitch in yoke.



**Before any connection, make sure machine and tractor hitches are compatible.**

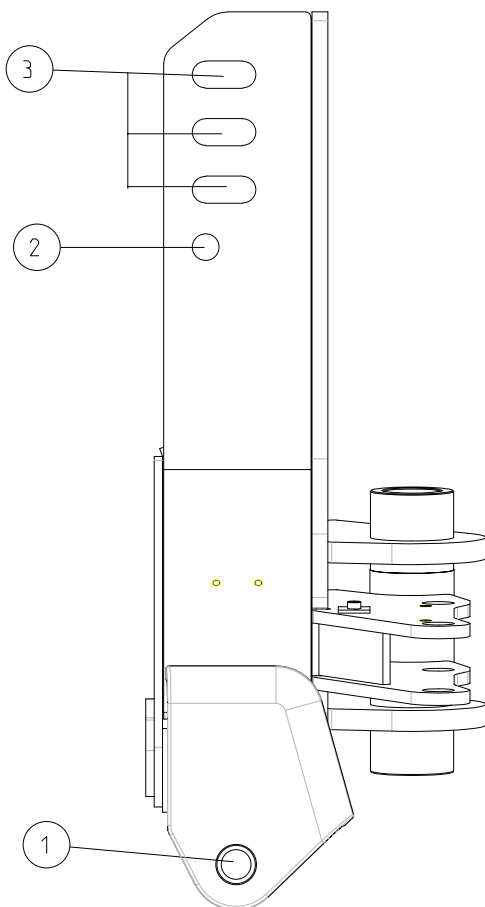
### [3-1] FIXED HITCH

Set tractor lift link arms to the same height.

Set stabilizers to let 3 to 5 cm lateral sway (in working position only).

Set tractor lift link arms on headstock pins ①.

Set top link :  
- in fixed position ② if draft control is done through top link  
- in one of the slots ③ if draft control is done through lift link arms.



## 4 – PREPARING THE MACHINE



Never over pass adjustment arms maximum length.

Indicative length may be modified from + / - 10 mm.

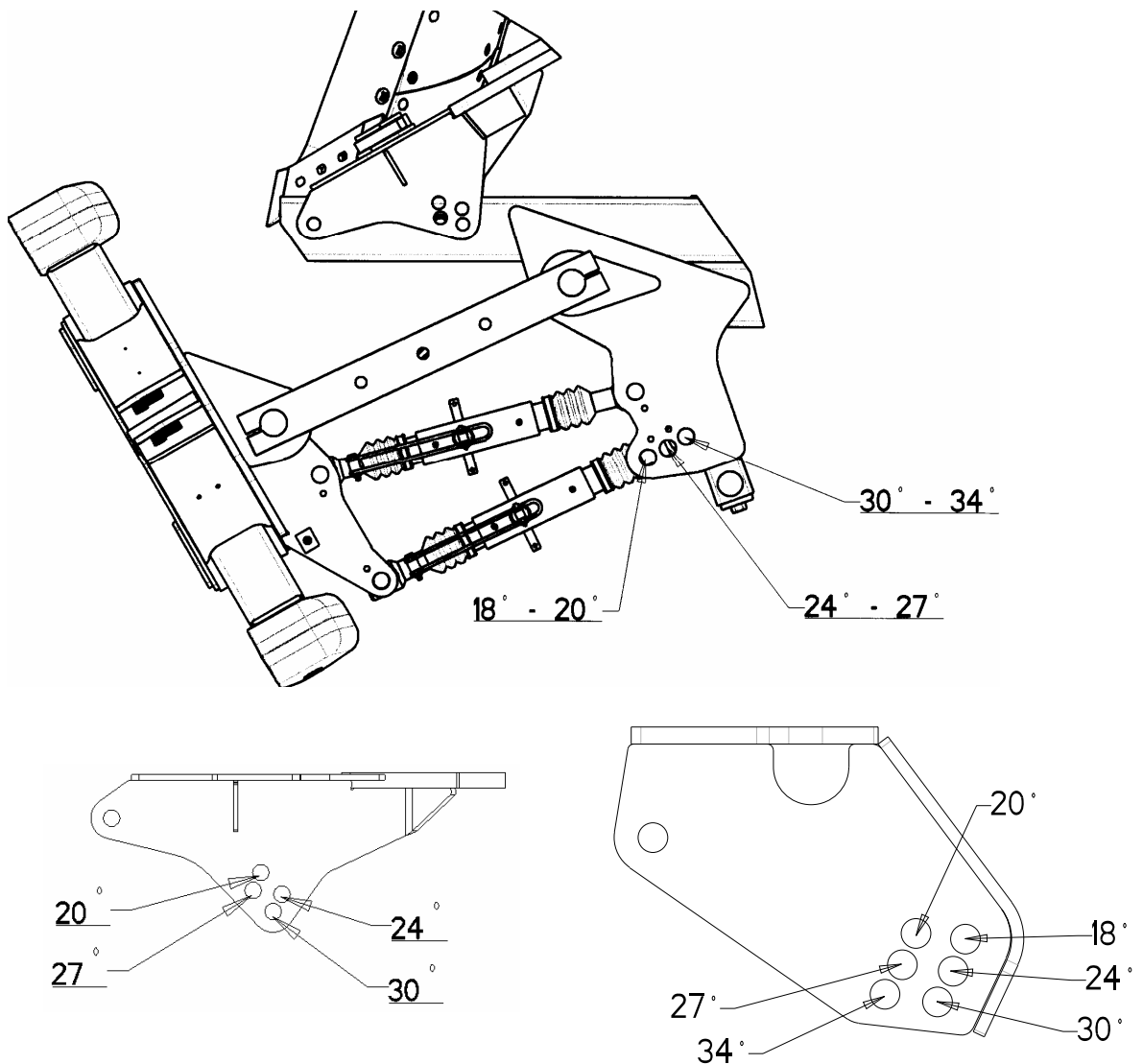
*Mechanical adjusting arm : 1 turn = 6 mm*

*Hydraulic adjusting arm : 1 turn = 3 mm*

### [4-1] ADJUSTING ELEMENTS WORKING WIDTH

Elements working width is mechanically adjustable

- 4 positions with "C" safety device
- 6 positions with "B" or "Y" safety devices.



Choose working width according to machine interbody distance.

ANGLE "X"	18° *	20°	24°	27°	30°	34°*
<b>Inter body 800 mm</b>	<b>X</b>	274mm (11")	325mm (12")	363mm (14")	400mm (16")	447mm (18")
<b>Inter body 900 mm</b>	278mm (11")	308mm (12")	366mm (14")	409mm (16")	450mm (18")	503mm (20")
<b>Inter body 1 000 mm</b>	309mm (12")	342mm (14")	407mm (16")	454mm (18")	500mm (20")	<b>X</b>

\* *Angles 18° and 34° are available only with "B" and "Y" safety devices.*

Working width given in mm with a close indication in inches.

## **[4-2] ADJUSTING ALIGNMENT ARM ②**

A) Axle to axle minimal and maximal distances :

1) mechanical arm : mini = 552mm maxi = 652mm

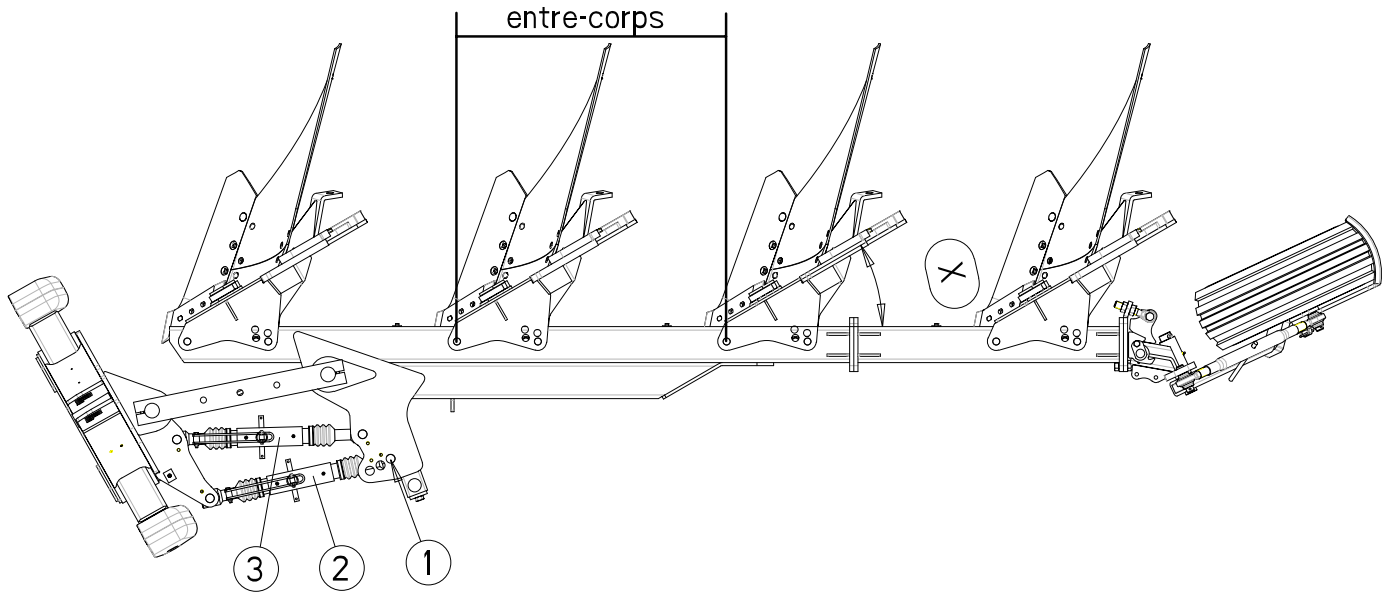
B) Alignment arm adjustment

Put rear pin in one of the holes ① (refer to previous page) according to chosen working width (angle X).

Set alignment arm ② length according to data given hereafter.

ANGLE X	18°	20°	24°	27°	30°	34°
Axle to axles	610mm	597mm	615mm	597mm	615mm	593mm

\* *Angles 18° and 34° are available only with "B" and "Y" safety devices.*



**X** corresponds to working width angle.

### **[4-3] ADJUSTING DEPORT ARM** ③

A) Axle to axle minimal and maximal distances :

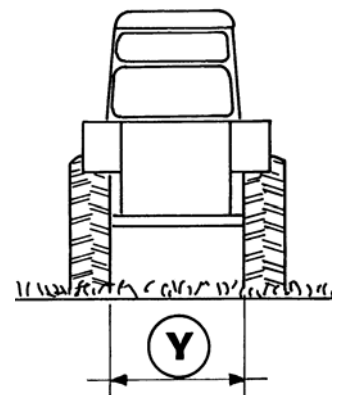
- 1) mechanical arm : mini = 552mm maxi = 652mm
- 2) hydraulic arm : mini = 560mm maxi = 625mm (refer to annex A)  
(distances for ram closed, stroke 600 mm)

B) Mechanical deport arm adjustment :

Measure real inter rear tyre distance (Y).

Set mechanical deport arm axle to axle distance following data given hereafter according to safety device and interbody distance.

**Y** corresponds to theoretic measurement.



## SAFETY DEVICE TYPE "C"

Inter body distance 800 mm

Angle (X) / width	20° / 11"	24° / 12"	27° / 14"	30° / 16"
<b>Inter tyre 1m00</b>	625mm	624mm	622mm	621mm
<b>Inter tyre 1m20</b>	608mm	607mm	605mm	603mm
<b>Inter tyre 1m40</b>	590mm	589mm	587mm	584mm
<b>Inter tyre 1m60</b>	572mm	572mm	570mm	566mm

Inter body distance 900 mm

Angle (X) / width	20° / 12"	24° / 14"	27° / 16"	30° / 18"
<b>Inter tyre 1m00</b>	630mm	630mm	630mm	631mm
<b>Inter tyre 1m20</b>	614mm	614mm	613mm	612mm
<b>Inter tyre 1m40</b>	596mm	596mm	595mm	593mm
<b>Inter tyre 1m60</b>	578mm	579mm	578mm	575mm

Inter body distance 1 000 mm

Angle (X) / width.	20° / 14"	24° / 16"	27° / 18"	30° / 20"
<b>Inter tyre 1m00</b>	636mm	637mm	638mm	✘
<b>Inter tyre 1m20</b>	620mm	621mm	621mm	621mm
<b>Inter tyre 1m40</b>	602mm	603mm	603mm	602mm
<b>Inter tyre 1m60</b>	584mm	586mm	586mm	584mm

## SAFETY DEVICE TYPE "B" AND "Y"

Inter body distance 800 mm

Angle (X) / width	20° / 11"	24° / 12"	27° / 14"	30° / 16"	34° / 18"
<b>Inter tyre 1m00</b>	634mm	637mm	637mm	✘	✘
<b>Inter tyre 1m20</b>	617mm	620mm	620mm	620mm	620mm
<b>Inter tyre 1m40</b>	600mm	603mm	602mm	600mm	600mm
<b>Inter tyre 1m60</b>	582mm	585mm	584mm	581mm	580mm

Inter body distance 900 mm

Angle (X) / width.	18° / 11"	20° / 12"	24° / 14"	27° / 16"	30° / 18"	34° / 20"
<b>Inter tyre 1m00</b>	639mm	641mm	642mm	642mm	✘	✘
<b>Inter tyre 1m20</b>	624mm	625mm	625mm	625mm	625mm	625mm
<b>Inter tyre 1m40</b>	607mm	608mm	608mm	607mm	605mm	605mm
<b>Inter tyre 1m60</b>	589mm	590mm	590mm	589mm	586mm	585mm

Inter body distance 1 000 mm

Angle (X) / width.	18° / 12"	20° / 14"	24° / 16"	27° / 18"	30° / 20"
<b>Inter tyre 1m00</b>	646mm	646mm	647mm	✘	✘
<b>Inter tyre 1m20</b>	631mm	631mm	631mm	633mm	634mm
<b>Inter tyre 1m40</b>	614mm	614mm	614mm	615mm	615mm
<b>Inter tyre 1m60</b>	596mm	597mm	596mm	597mm	596mm

## 5 – PLOUGHING DEPTH

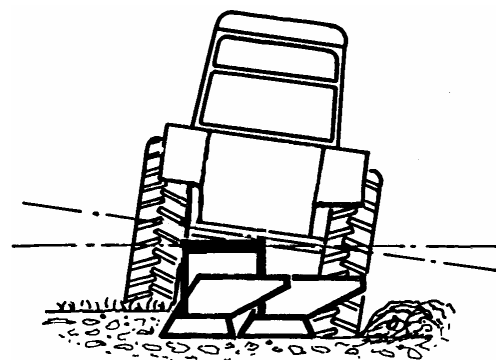
According to desired working depth :

- for front furrows, adjust tractor hydraulic lift height
- for rear furrows, adjust gauge wheel turnbuckle length (refer to annex B)

## 6 – INCLINAISON

Starting at the second pass, this adjustment shall be done so that elements work perpendicular with the ground.

On S4 plough range, headstock is designed with a 5° inclination angle. Precise final adjustment may be done in the field with lift link arms.



## 7 – LEVELLING

Machine shall run level front to rear.

This adjustment is done with top link.

For machines equipped with a gauge wheel, set top link length so that pin is free in the slot in working position.

## 8 – ALIGNMENT CORRECTION

Alignment is properly adjusted when top link is lined up with tractor traction line. Make sure stabilizers are free in working position.

According to circumstances, initial settlement may be changed +/- 10 mm.

## 9 – DEPORT CORRECTION

Front furrow width of cut is properly adjusted when it works the same width as the others. Then ploughing is even.

According to circumstances, initial front furrow arm settlement may be changed +/- 10 mm.

## 10 – BOTTOMS PITCH

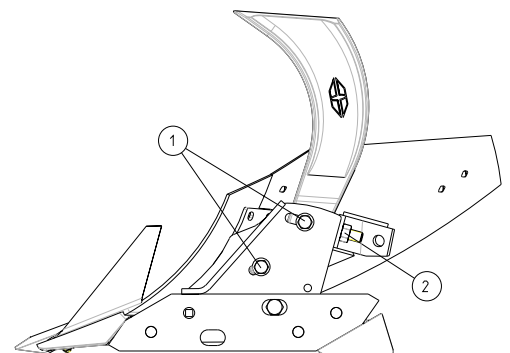
Grégoire-Besson bottoms have an adjustable pitch to adjust penetration angle. It is set at the manufacture to work in most of regular conditions.

In a hard ground, penetration angle shall be increased.

In stony or soft grounds, penetration angle shall be reduced.

To change penetration angle :

- loose both bolts ① and both jam nuts on eye end bolt ②
- set pitch acting on eye end bolt ②
- make sure all elements are set the same
- tight back all bolts ① and jam nuts on eye end bolts ②.



## 11 – TRANSPORT



**GREGOIRE-BESSON equipments shall always be used according to current applicable laws concerning road traffic and operator's safety.**

**Drive at a reasonable speed to keep control of vehicle.**

**Transporting on public road, required light and sin kits shall be installed. They may be removed to avoid any damage during field operation.**



**Transporting in public road, lock all control levers in the cab to prevent any unforeseen manoeuvre.**

## 12 – LIGHT BOLT SAFETY DEVICE TYPE "C"

Bottoms raise upward : when machine is in the field, stay away from tripping area.

Safety device type « C » is a one shear bolt safety device, bolt Ø 14 mm, length 70 mm.

Trip pressure on point is function of bolt grade and under frame clearance.

<b>POUGH</b> Type : SC4	<b>BOLT</b> VI3010+VJ323 Grade 8.8
<b>Height 0m75</b>	3 800 kg

## **13 – BOLT SAFETY DEVICE TYPE "B"**

Bottoms raise upward : when machine is in the field, stay away from tripping area.

Safety device type « B » is a two shear bolts safety device, bolts Ø 16 mm, length 50 mm.

Trip pressure on point is function of bolt grade and under frame clearance.

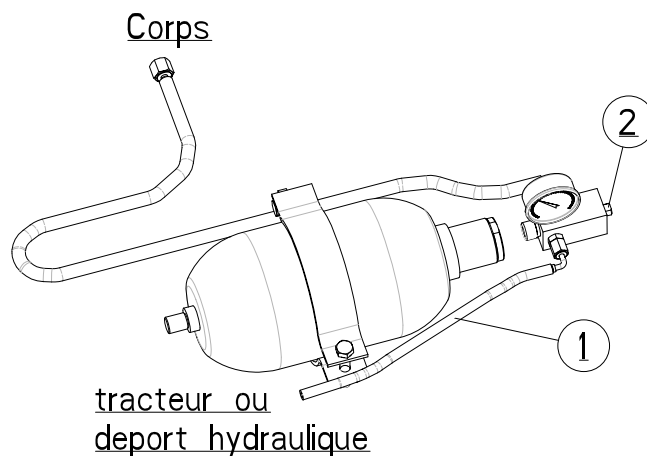
<b>PLOUGH Type : SB4</b>	<b>BOLT VI3106+VJ324 Grade 8.8</b>	<b>BOLT VI3107+VJ324 Grade 10.9</b>
<b>Height 0m70</b>	5 100 kg	<b>×</b>
<b>Height 0m75</b>	4 800 kg	6 000 kg
<b>Height 0m80</b>	4 200 kg	5 700 kg

## **14 – NON-STOP HYDRAULIC SAFETY DEVICE TYPE "Y"**

Bottoms raise upward : when machine is in the field, stay away from tripping area.

### **[14-1] – ADJUSTING TRIPPING PRESSURE**

- 1) Connect hose ① to the tractor.
- 2) Loose screw ② from 2 to 3 turns.
- 3) Set desired point trip pressure adding or removing oil in the circuit. Visualize adjustment on the gauge.
- 4) Tight screw ② to close circuit.
- 5) Disconnect hose ① from the tractor.



UNDER FRAME CLEARANCE	RAMS DIAMETER	POINT TRIP PRESSURE in kg (according to accumulator)			
		Accumulator 100bars		Accumulator 150 bars	
		Pmini=110b	Pmaxi=150b	Pmini=160b	Pmaxi=200b
<b>0m70</b>	⊙90	660	900	960	1200
	⊙100	854	1165	1242	1552
	⊙110	1067	1455	1552	1940
	⊙125	1425	1944	2073	2592
<b>0m75</b>	⊙90	624	850	907	1135
	⊙100	806	1100	1173	1466
	⊙110	1008	1375	1466	1832
	⊙125	1345	1837	1958	2450
<b>0m80</b>	⊙90	591	806	860	1075
	⊙100	764	1042	1111	1390
	⊙110	955	1302	1390	1736
	⊙125	1275	1740	1857	2320

### **Particular case :**

If plough is equipped with an hydraulic front furrow ram, hose ① is linked to the circuit.

To set pressure, follow instructions 2), 3) and 4).

### **[14-2] – ACCUMULATOR PRESSURE**

In standard assembly conditions, SY4 is equipped with a 4 litres accumulator, 100 bars. As an option, a 6 litres accumulator may be installed.



**Pressure un accumulator is set by manufacturer and shall never be changed.**



**Maximum admissible pressure is written on accumulator and shall never be over passed. If so, warranty would become void and Grégoire-Besson shall not be responsible for any damage or injury. Accumulator shall be checked once every 10 years.**

### **[14-3] – ADDITIONAL FURROW LINKAGE**

Additional furrow linkage is done through a screw type connector. Additional furrow may then be connected or disconnected using two wrenches.

## **15 – MAINTENANCE**

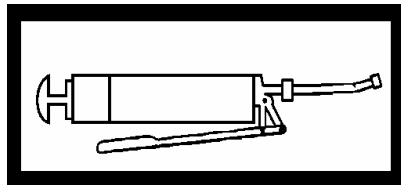


**Before, during and after any maintenance operation, always follow safety recommendations.**

**Always make sure area is clean, clear and dry enough.**

All articulations shall be regularly greased.

Grease fittings are indicated by stickers.



Regularly check bolts and nuts tightness.

Regularly check tyre pressure : do not let it drop too low, do not inflate too much.



**ATTENTION : tyre explosion may cause severe injury.  
Tyre assembly shall be done by specially trained operators.**

Genuine Grégoire-Besson parts have been specially designed and developed. Only the use of these parts will ensure proper fit, longevity and field quality work of the machine.

If plough shall be stored, even for a short period : clean it and grease pivot points and wearing parts..

### **PLOUGH STORAGE**

When ploughing season is over :

Clean the machine to remove all dirt that could retain moisture and lead to rust.

Do all necessary touch up of paint.

Make sure there are no worn or broken parts, if so replace them immediately.

Grease all wearing parts.

Store plough away from human activity in a water proof and dust free area.

**GOOD MAINTENANCE ENSURES MACHINE LONGLASTING**

**NEVER SEARCH A LEAK WITH YOUR HAND**

**In case of injury, immediately refer to a doctor. Any fluid injected under the skin shall be surgically removed within a few hours or gangrene may result.**

**[1] PRINCIPLE**

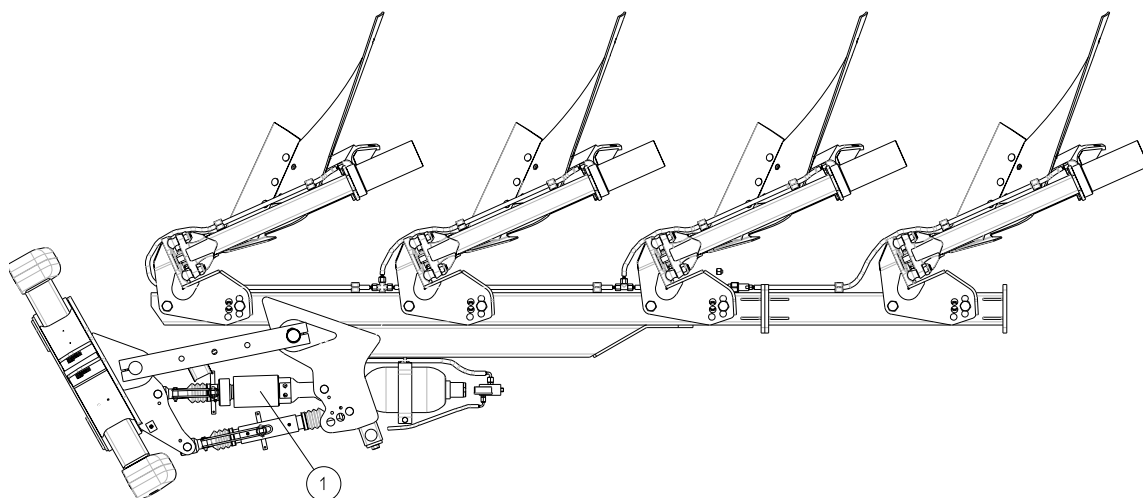
Mechanical front furrow width adjuster arm may be replaced by an hydraulic arm ①.

*Hydraulic arm axle to axle distance :*

mini = 560mm      maxi = 625mm

distances given ram closed, ram stroke 60 mm

To operate the machine, follow all recommendations given in standard operator manual, and then the ones given in Annex A.

**[2] HYDRAULIC CONNECTIONS**

Connect hydraulic hoses to a double acting remote on tractor.

### **[3] ADJUSTMENT**

Fully open front furrow ram ①.

Set axle to axle distance following hereafter given datas, corresponding to previously chosen working width angle X.

ANGLE "X"	18°	20°	24°	27°	30°	34°
Axle to axle	660mm	655mm	650mm	640mm	635mm	625mm

Initial adjustment may be changed + / - 10 mm.

### **[4] - SPECIFICATIONS**

Hydraulic front furrow arm allows « on the go » adjustment according to working width (= angle X), inter body distance and inter tyre distance (= distance Y).

#### **INTER BODY DISTANCE 800 mm**

ANGLE "X"	20°	24°	27°	30°	34°
Inter tyre mini	0m75	0m80	0m90	1m00	1m10
Inter tyre maxi	1m50	1m50	1m60	1m65	1m70

#### **INTER BODY DISTANCE 900 mm**

ANGLE "X"	18°	20°	24°	27°	30°	34°
Inter tyre mini	0m75	0m80	0m90	1m00	1m08	1m20
Inter tyre maxi	1m50	1m55	1m60	1m70	1m72	1m82

#### **INTER BODY DISTANCE 1 000 mm**

ANGLE "X"	18°	20°	24°	27°	30°
Inter tyre mini	0m80	0m86	1m00	1m10	1m20
Inter tyre maxi	1m55	1m60	1m70	1m79	1m82

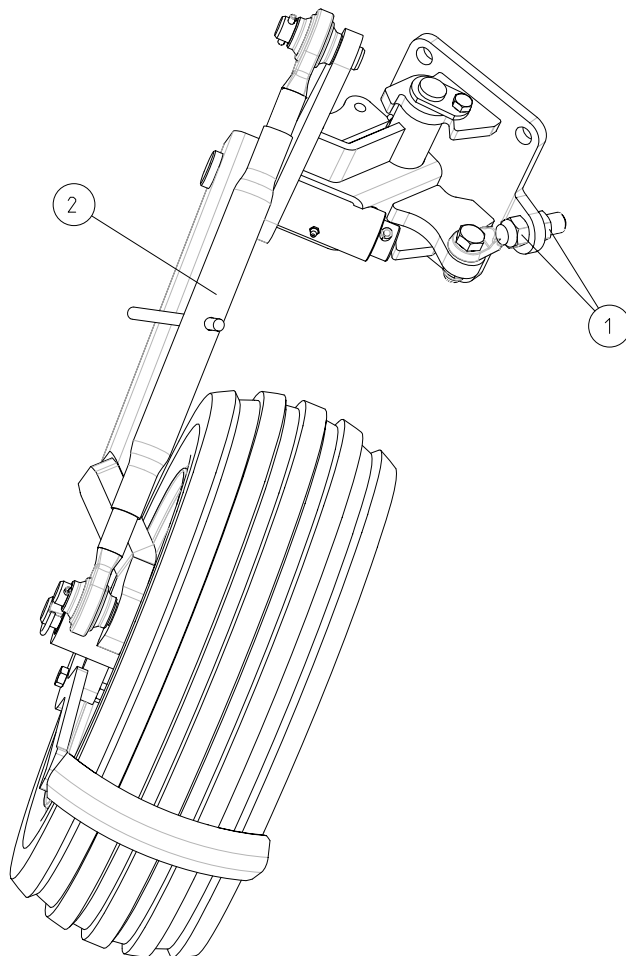
*\* Angles 18° and 34° are available only with "B" and "Y" safety devices.*

**DEPTH WHEEL ONLY****Adjusting wheel angle**

- Loose both jam nuts ① et mettre la roue parallèle aux corps.
- Turn wheel parallel with working elements.
- Tight back both jam nuts ①

**Adjusting working depth**

- to increase working depth, raise the wheel screwing turnbuckle ②.
- to decrease working depth, lower the wheel unscrewing turnbuckle ②.



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